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ABSTRACT

The purpose of the present investigation is to assess social class and race differences in the use of reinforcement by mothers and children. The general hypotheses underlying this approach is the expectation of a functional similarity between social class and race effects on the use of reinforcements by mothers and children. The subjects were 109 four-year-old boys and girls, their mothers, and a corresponding number of three-year-olds. The subjects were divided according to race and class; assignment to social class was determined by father's occupation and area of residence in Los Angeles. Use of positive reinforcement was defined by statements of praise, encouragement, and affirmation; negative reinforcement, by the reverse. The experimental situation set up involved having the subjects teach each other assembling of puzzles. Their method of teaching (reinforcement) was studied. The data relating social class and race to children's and mothers' patterns of reinforcement suggest more general social class and race differences in maternal reinforcement styles. It can be inferred from the findings that the lower-class black child received more negative reinforcements from his mother and less positive reinforcements from his peers than the middle-class white child. (JW)

Teaching Styles of Four Year Olds and Their Mothers*

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It has long been recognized that social class and intellectual performance are related. Children from economically disadvantaged homes have, in general, more depressed scores on achievement, learning, and intelligence measures than children from more advantaged backgrounds (Deutch et al., 1968; Jensen, 1969). In addition, a research literature exists documenting different behavior patterns and socialization practices in parents of different social classes (Becker, 1964; Bronfenbrenner, 1958; Kohn, 1963; Miller and Swanson, 1960; Sears, Maccoby, & Levin, 1957). However, only within the last decade have there been efforts to directly link specific patterns of the mother's behavior to the child's level and type of cognitive skills.

The theorizing of Bernstein (1961), emphasizing the importance of maternal speech as a reflection of social structure shaping the child's cognitive development, provided the impetus to the study of mechanisms mediating the effects of social class membership upon the child's cognitive performance. Hess and Shipman (1965, 1968), like Bernstein (1962) provided evi-

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dence of two modes of linguistic style, the elaborate formal code being more characteristic of the middle class parent and the restricted code, manifested in a rigid and limited grammatical usage, being more typical of the lower class parent. In addition, Hess and Shipman (1967, 1968) related maternal linguistic codes and maternal teaching strategies to the child's level of cognitive functioning.

The results of a recent study by Bee and her co-workers (1969) support Bernstein's formulations regarding maternal language modes and social class and are also consistent with the Hess and Shipman findings relating maternal teaching strategies to social class. Of particular relevance to the present study is the evidence they report indicating that lower class mothers are more restrictive and negative than middle class mothers in their interactions with their children.

This tendency of lower class mothers to make more negative responses is compatible with the results of a recent study by Feshbach and Devor (1969) which demonstrated that as early as age four, children display very different reinforcement patterns as a function of their race and social class background. Middle class white four year olds used substantially more positive reinforcement when "instructing" a younger peer than did the middle class black, lower class white or lower class black groups. It seems reasonable to assume that these social class and race differences in children's use of reinforcement are a reflection of social class and race differences in parental reinforcement

style. Since reinforcement is a significant factor in the learning process, having both motivational and information functions, variations in reinforcement style may be another factor mediating the relationship between social class membership and the child's cognitive performance.

The purpose of the present investigation is to assess social class and race differences in mothers' and children's use of reinforcement. The general hypotheses underlying this approach is the expectation of a functional similarity between social class and race effects on children's and on mothers' use of reinforcement.

METHOD

Subjects

The subjects were 109 four year old boys and girls, their mothers, and a corresponding number of three year olds. There were four groups of subjects based on social class and race: middle class-white (MCW), lower class-white (LCW), middle class-black (MCB), and lower class-black (LCB). Assignment to class was determined by father's occupation and area of residence. The participating sample of mothers and children were drawn from 11 different parent-education pre-school centers in Los Angeles.

Procedure

There were two instructional interaction situations. During the first session the four year old child was paired with a randomly selected three year old child of the same sex, social class, and ethnic background. The four year olds acted as "teachers" while the three year olds acted as "pupils". There were 57 male and 52 female pairs.

Prior to the first experimental situation the four year old was taken to the experimental room where the experimenter carefully described the details of a simple wooden puzzle. The child was then given three trials to assemble it. During the first trial, the experimenter actively helped the child. For the second trial the experimenter made one positive verbal remark ("that's very good") and one critical remark ("that's not right") concerning the child's performance. For the third trial the four year old completed the puzzle by himself while the experimenter left to get the three year old.

After being provided appropriate instructions the four year old teacher-child proceeded to teach the puzzle to the younger child. All comments made by the teacher-child pertaining to the "pupil's" performance were recorded verbatim and subsequently categorized as either positive or negative reinforcement. The positive category included statements of praise, encouragement and affirmation such as "That's right," "There you go," "That's it," while the negative category included

criticism, negations, and derogatory comments such as "That doesn't go there," "No, not that way," "Uh uh". To determine the reliability of this dichotomous classification, 60 randomly selected statements of reinforcement were scored by two independent raters. There were only two instances in which the raters disagreed. The total number of positive and total number of negative statements were determined for each child and constituted the reinforcement measures. In addition, the number of errors and time taken to complete the puzzle were calculated for the younger children.

The second instructional sequence was scheduled one hour after the initial situation. During this second session each mother was asked to teach her own four year old child a puzzle. The study had been initially represented to the parents as one which focused on how children behaved in various learning situations and the mothers understood that this task represented one of these situations. The same procedures used in analyzing the child-child interaction were applied to the mother-child interaction. The reliability of scoring for the categorization of reinforcement was again very high, there being only one disagreement for 60 randomly selected statements of reinforcement.

RESULTS

The experimental findings will be presented in the following order:

1) The types of reinforcements used by the four year old teacher-child in his instruction of the three year old "pupil",

2) The types of reinforcements used by the mothers when instructing their four year old children, and

3) The relationships between the reinforcements used by the four year olds and those used by their mothers.

The mean frequency of positive reinforcements displayed by the four year olds in each of the experimental sub-groups is presented in Table 1, (Tables attached). The pattern of these data, with the exception of the relatively high number of positive reinforcements employed by lower class white boys, is similar to that observed in the earlier Feshbach and Devor (1969) study. White children made significantly greater use of positive reinforcements than black children, with the middle class blacks again using fewer positive reinforcements than any other group. The variance in this group was also lower than that in the other groups and, in view of the divided opinion concerning the influence of heterogeneity upon the analysis of variance, a log transformation of the data was carried out. An analysis of variance applied to these transformed data yielded an even stronger race effect than that indicated in Table 1, with an F of 7.6 for the race variable significant at the .01 level.

The mean frequency of negative reinforcements used by the children in each sub-group is presented in Table 2. Although

the earlier Feshbach and Devor (1969) study had not yielded any significant ethnic differences in the frequency of negative reinforcements, the present data indicate that white children tend to make greater use than black children of negative as well as positive reinforcements. The effect of the race factor becomes significant at the .05 level, when an analysis of variance is applied to a log transformation of the data. Some insight into the functional significance of the greater utilization of positive and negative reinforcements by white as compared to black four year olds is provided by an examination of the performance of their three year old "pupils". The differences between the white and black three year olds in time taken to complete the puzzle and in number of errors made were small and statistically insignificant. However, pupil performance was not unimportant. For the white sample, there was a correlation of +.71 between the four year old teacher-child's negative reinforcement score and the number of errors made by his pupil while the comparable correlation for the black teacher-child's behavior and the performance of his pupil was close to zero.

The analyses of the mother-child interaction, while consistent with the findings for the child-child interaction reflect a somewhat different pattern. As Table 3 indicates, there are no significant race or class differences in the use of positive reinforcements by the mothers when instructing their four year old children. There is a tendency, significant at only the .10 level, for mothers to administer more positive reinforcements to boys than to girls.

Significant class and race differences emerge, when the frequency of mothers' use of negative reinforcement is examined. These data are presented in Table 4. Lower class mothers use many more negative reinforcements than middle class mothers, and the number of negative reinforcements displayed by black mothers is considerably greater than that displayed by white mothers. The effects of race appear to be more pronounced for lower class than middle class mothers, the p value for the interaction falling just short of the .05 level.

Although no differences were found in the performance of the three year olds when administered the puzzle task by the four year olds, there are highly significant race differences in the error and time scores of the four year olds when they are instructed by their mothers. As Table 5 indicates, both male and female black children, regardless of social class, take longer to complete the puzzle and made significantly more errors than white children. In this instance, the greater use of negative reinforcements by the black mothers could be a function of the child's performance since the frequency of negative reinforcements administered by the mother is significantly correlated with the number of errors made by the child.

The correlations between the types of reinforcements used by the mother and those used by her child are presented in Table 6. These correlations are presented separately for each class and race sub-groups and for the entire sample as well.

For the total sample only, there is a small but statistically reliable correlation between the mothers' and children's use of positive reinforcement. Mother's frequency of positive reinforcement is also correlated with her child's use of negative reinforcement. The only other significant relationship obtained is the positive correlation of .65, significant at the .01 level, between middle class white mothers' and their children's use of negative reinforcement.

DISCUSSION

These data reflect an interesting but complex set of correlations between the mother's and child's use of positive and negative reinforcement. In general, they can be interpreted in terms of modeling influences. However, the limited degree of association found overall, and the fact that a number of correlations were carried out, calls for cross-validation procedures.

More directly relevant to the purpose of the present study are the data relating social class and race to children's and mothers' patterns of reinforcement. The results for the child-child interaction are generally similar to those obtained in the earlier Feshbach and Devor study while the mother-child interaction data are in accord with the findings reported by Hess and Shipman and by Bee and her colleagues. Although the experimental task may be a more contrived situation for the mothers than for the children, the systematic pattern of the

obtained results and their consistency with other data strongly suggest that these findings are indicative of more general social class and race differences in maternal reinforcement styles.

One can infer from these findings that the lower class black child received more negative reinforcements from his mother and less positive reinforcements from his peers than the middle class white child. It would appear then that the learning environment for the lower class black child is a less hospitable one than the environment experienced by his white advantaged counterpart and, is potentially more disruptive of the learning process.

It remains for subsequent research efforts to establish the linkages between the parent's reinforcement style, the child's reinforcement style and the child's cognitive performance so that methods can be developed for intervening in this chain when reinforcement experiences are not conducive to effective cognitive functioning.

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Teaching Styles of Four
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Table 1

Positive Reinforcements Used by Four Year-Old Teacher Children as a Function
of Social Class, Race and Sex

A. Mean Frequencies

	Boys		Girls	
	White	Black	White	Black
Middle Class	3.3	0.1	1.1	.05
Lower Class	2.4	0.8	1.2	.09

B. ANOVA

Source	SS	df	MS	F
Class	0.12	1	0.12	0.01
Sex	10.62	1	10.62	1.27
Race	38.95	1	38.95	4.66*
C X S	0.80	1	0.80	0.10
C X R	3.97	1	3.97	0.47
R X S	18.92	1	18.92	2.61
C X R X S	1.96	1	1.96	0.23
Error	845.11	101	8.37	

* $p < .05$

Table 2

Negative Reinforcements Used by Four Year Old Teacher
Children as a Function of Social Class, Race and Sex

A. Mean Frequencies

	Boys		Girls	
	White	Black	White	Black
Middle Class	3.3	.6	.94	0.0
Lower Class	3.6	1.9	1.3	1.3

B. ANOVA

Source	SS	df	MS	F
Class	61.41	1	61.41	1.92
Sex	17.66	1	17.66	0.55
Race	94.93	1	94.93	2.97
C X S	0.00	1	0.00	0.00
C X R	46.76	1	46.76	1.46
R X S	2.18	1	2.18	0.09
C X R X S	42.45	1	42.45	1.33
Error	3227.17	101	31.95	

Table 3

Positive Reinforcements Administered to Four Year Old Boys and Girls by their Mothers as a Function of Social Class and Race

A. Mean Frequencies

	Boys		Girls	
	White	Black	White	Black
Middle Class	7.3	5.4	5.3	3.3
Lower Class	4.7	5.6	4.6	4.0

B. ANOVA

Source	SS	df	MS	F
Class	6.93	1	6.93	0.52
Sex	41.19	1	41.19	3.12
Race	16.47	1	16.47	1.25
C X S	8.44	1	8.44	0.64
C X R	21.01	1	21.01	1.59
R X S	3.70	1	3.70	0.28
C X R X S	2.29	1	2.29	0.17
Error	1335.21	101	13.22	

Table 4

Negative Reinforcements Administered to Four Year Old Boys and Girls by their Mothers as a Function of Social Class and Race

A. Mean Frequencies

	Boys		Girls	
	White	Black	White	Black
Middle Class	1.8	2.6	.8	.5
Lower Class	2.6	6.3	1.8	4.5

B. ANOVA

Source	SS	df	MS	F
Class	112.88	1	112.88	11.12**
Sex	39.13	1	39.13	3.86
Race	60.15	1	60.15	5.93*
C X S	0.33	1	0.33	0.03
C X R	46.48	1	46.48	4.58*
R X S	5.60	1	5.60	0.55
C X R X S	0.00	1	0.00	0.00
Error	1024.86	101	10.15	

* $p < .05$

** $p < .01$

TABLE 5

Time Obtained by Four Year Olds as "Pupils"

A. Mean Time (seconds)

	Boys		Girls	
	White	Black	White	Black
Middle Class	146	211	133	174
Lower Class	145	222	152	178

B. ANOVA

Source	SS	df	MS	F
Class	1496.10	1	1496.10	0.26
Sex	9320.53	1	9320.53	1.58
Race	54497.22	1	54497.22	9.34**
C X S	170.87	1	170.87	0.03
C X R	4.79	1	4.79	0.00
R X S	7486.51	1	7486.51	1.28
C X R X S	959.68	1	959.68	0.16
Error	589099.32	101	5832.66	

**
p < .05

TABLE 6
Number of Errors Made by Four
Year Olds as "Pupils"

A. Mean Time

	Boys		Girls	
	White	Black	White	Black
Middle Class	5.8	6.6	3.6	7.3
Lower Class	4.9	7.9	5.2	6.1

B. ANOVA

Source	SS	df	MS	F
Class	0.74	1	0.74	0.07
Sex	11.72	1	11.72	1.05
Race	86.64	1	86.64	7.78**
C X S	0.00	1	0.00	0.00
C X R	0.25	1	0.25	0.02
R X S	0.85	1	0.85	0.08
C X R X S	30.51	1	30.51	2.74
Error	1124.14	101	11.13	

**
p < .01

TABLE 7

Interrelationships Among Child's and Mother's
Use of Positive and Negative Reinforcements

		Child's Use of Negative Reinforcement	Mother's Use of Positive Reinforcement	Mother's Use of Negative Reinforcement
Child's Use of Positive Reinforcement	MC-W	.31 [*]	.13	.10
	LC-W	.79 ^{**}	.29	.02
	MC-B	-.21	.25	-.10
	LC-B	.30	.24	.04
	Total	.57 ^{**}	.22 [*]	.04
Child's Use of Negative Reinforcement	MC-W		.28	.65 ^{**}
	LC-W		.21	-.08
	MC-B		.02	.07
	LC-B		.15	.18
	Total		.23 [*]	.16
Mother's Use of Positive Reinforcement	MC-W			.54 ^{**}
	LC-W			.54 ^{**}
	MC-B			.60 [*]
	LC-B			.37
	Total			.37 ^{**}

(MC-W) Middle Class White (N=40)
 (LC-W) Lower Class White (N=38)
 (MC-B) Middle Class Black (N=11)
 (LC-B) Lower Class White (N=20)
 Total (N=109)

*
p < .05

**p < .01